(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
18 October 2001 (18.10.2001)

PCT

(10) International Publication Number
WO 01/76764 A1

(51) International Patent Classification[7]: B05B 7/04, A62C 31/02

(21) International Application Number: PCT/SK01/00010

(22) International Filing Date: 11 April 2001 (11.04.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PV 0527-2000 11 April 2000 (11.04.2000) SK

(71) Applicant and
(72) Inventor: **CHROBÁK, Július** [SK/SK]; Podtatranského 9, 040 01 Košice (SK).

(74) Agent: **REGINA, Ivan**; Klimkovicova 20, 040 11 Kosice (SK).

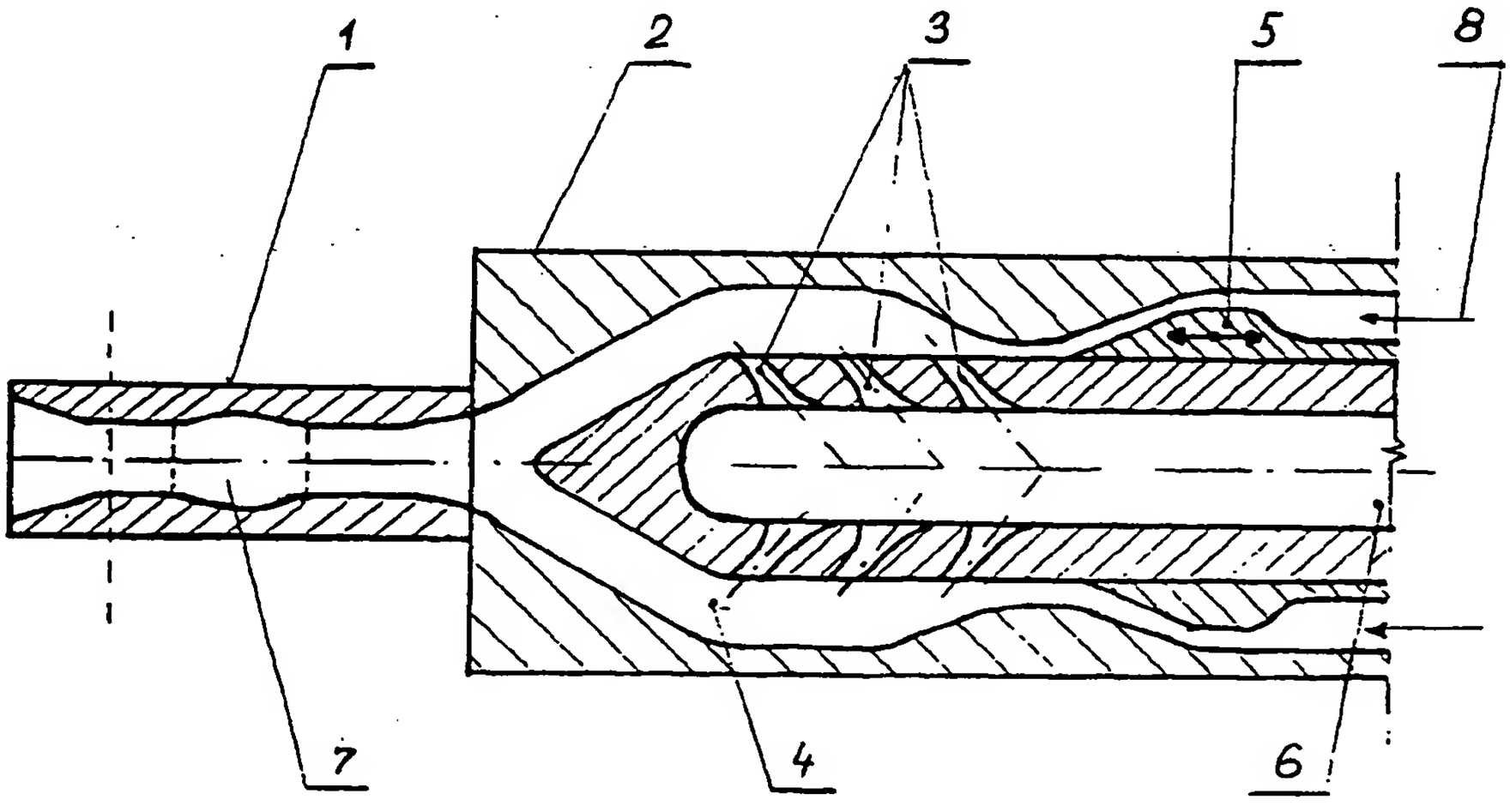
(81) Designated States *(national)*: CA, CN, CZ, HU, JP, PL, US.

(84) Designated States *(regional)*: European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: EQUIPMENT FOR INCREASING THE CARRYING RADIUS OF A CONTINUOUS AEROSOL STREAM



(57) Abstract: The equipment for increasing the carrying radius of an aerosol stream uses the idea of reducing friction force between the outgoing micro drops and the surrounding atmosphere by surrounding the aerosol micro drops with the quickly moving carrying gas. The equipment consists of a nozzle for accelerating and forming the ongoing aerosol stream (1), into which the aerosol-gas mixture is discharged from a mixing chamber (4) having the same axis. The cylindrical mixing chamber (4) comprises aerosol inlet nozzles (3) and a gas inlet channel (8) provided with a conical member (5).

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EQUIPMENT FOR INCREASING THE CARRYING RADIUS OF A CONTINUOUS AEROSOL STREAM

The Area of Technique:

The invention concerns the equipment for fire extinguishing, spraying of chemicals in agriculture. The equipment can be used wherever it is necessary to deliver aerosol for longer distance.

The Present State of Technique:

To spray the continual aerosol stream into the atmospheric space are used the systems which reach high output speed of aerosol stream from the accelerating nozzle on the basis of high liquid pressures. From the construction point of view, they are realized as accelerating nozzles which inject micro drops of liquid axial into the accelerating nozzle with inlet of atmospheric air.

Their disadvantage is the fact that the micro drops of liquid fly into the relatively stable atmospheric space high velocity. The micro drops surface is braked with the force which is non–linearly dependent on the difference of velocity vectors of the exiting micro drop from the nozzle, and moving gasses of the surrounding atmosphere, and on the adhesive forces of atmosphere gasses against the ejected liquid drops. From this fact emerges the following restriction. The higher velocity of output micro drop we want to reach, the higher liquid pressure must be used. The higher difference of the micro drop velocity vectors and surrounding atmosphere exists, there is the larger friction force which breaks the micro drop. The larger friction force will cause shortening range and simultaneously larger amount of heat originated from the friction of drop surface is added to the micro drop, which in limiting case can cause its evaporating.

The Essence of Invention:

The above mentioned disadvantages of present stay are eliminated with equipment for increasing the radius of carry continual aerosol stream according to the invention consists from classical nozzle for accelerating and forming the outgoing aerosol stream and mixing chamber, the essence of invention is based on the fact that the entry of nozzle for accelerating and forming the outgoing aerosol stream is the output of mixing chamber which axis is equal with the axis of nozzle for accelerating and forming the outgoing aerosol stream. The aerosol is delivered to the mixing chamber with the system of nozzles which have been made radial into the surface of cylindrical chamber for aerosol inlet, which has common axis with the mixing chamber. The mixing chamber is connected to the inlet gas channel. Longitudinal shape of the inlet gas channel is conic at the entry into the mixing chamber and in this space there exists and axially adjustable conic solid by which the amount and velocity of the gas coming into the mixing chamber is regulated.

According to the invention, the equipment ejects liquid micro drops from the nozzle together with the quickly moving stream of gasses. Thus friction force is made on the base of the difference of velocity vectors of the outgoing gasses which coat micro drops and on the base of friction between carrying gas and surrounding gasses of atmosphere. For the carrying gas, it is suitable to use gas mixture or gas with stable and symmetrical molecules. The gas choice depends on conditions under which the equipment is used. Atmospheric air is also suitable for simple use.

The advantage of the invention is possibility to use low media pressures and high range of aerosol continual stream. As it results from the principle, the equipment can work in pulse regime as well.

The Overview of the Pictures in the Plans:

The invention will be explained more detail by the pictures of the plans. Picture 1 presents the longitudinal section of the equipment and the picture 2 presents the longitudinal section of the equipment that it is constructionally derived from picture 1 with the axially inverse procedure.

The Examples of Invention Implementation:

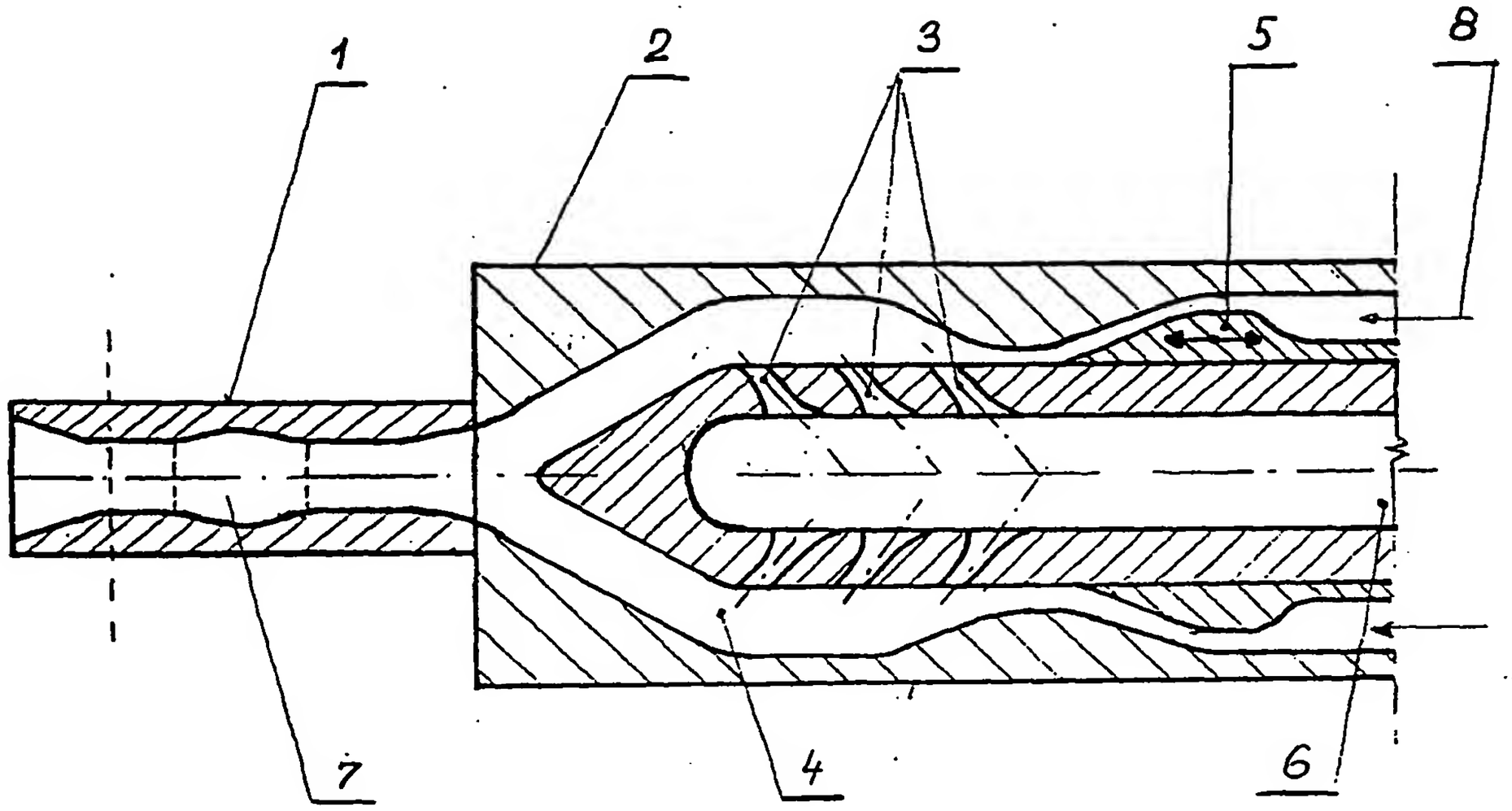
The equipment in picture 1 consists of classical nozzle 1 for the accelerating and forming the outgoing aerosol stream in which there can be a homogenizing chamber 7 in the middle part. The enter of this nozzle is the output of the mixing chamber 4, its axis is identical with the axis of outgoing nozzle 1. Aerosol is delivered into the mixing chamber 4 with the system of nozzles 3, which are radially drilled into the surface of cylindrical chamber 6 to the aerosol inlet. The mixing chamber is connected to inlet gas channel 8 with the hole through which carrying gas is delivered into it. Longitudinal shape of inlet gas channel 8 is conic at the entry into the mixing chamber and in this space, there is axially adjustable conic solid 5, by which the amount and the velocity of the gas entering into the mixing chamber is regulated. The outer surface 2 has cylindrical shape and span either mixing chamber 4 or the chamber to the aerosol inlet 6, at technical solution in picture 2.

Industrial Versatility:

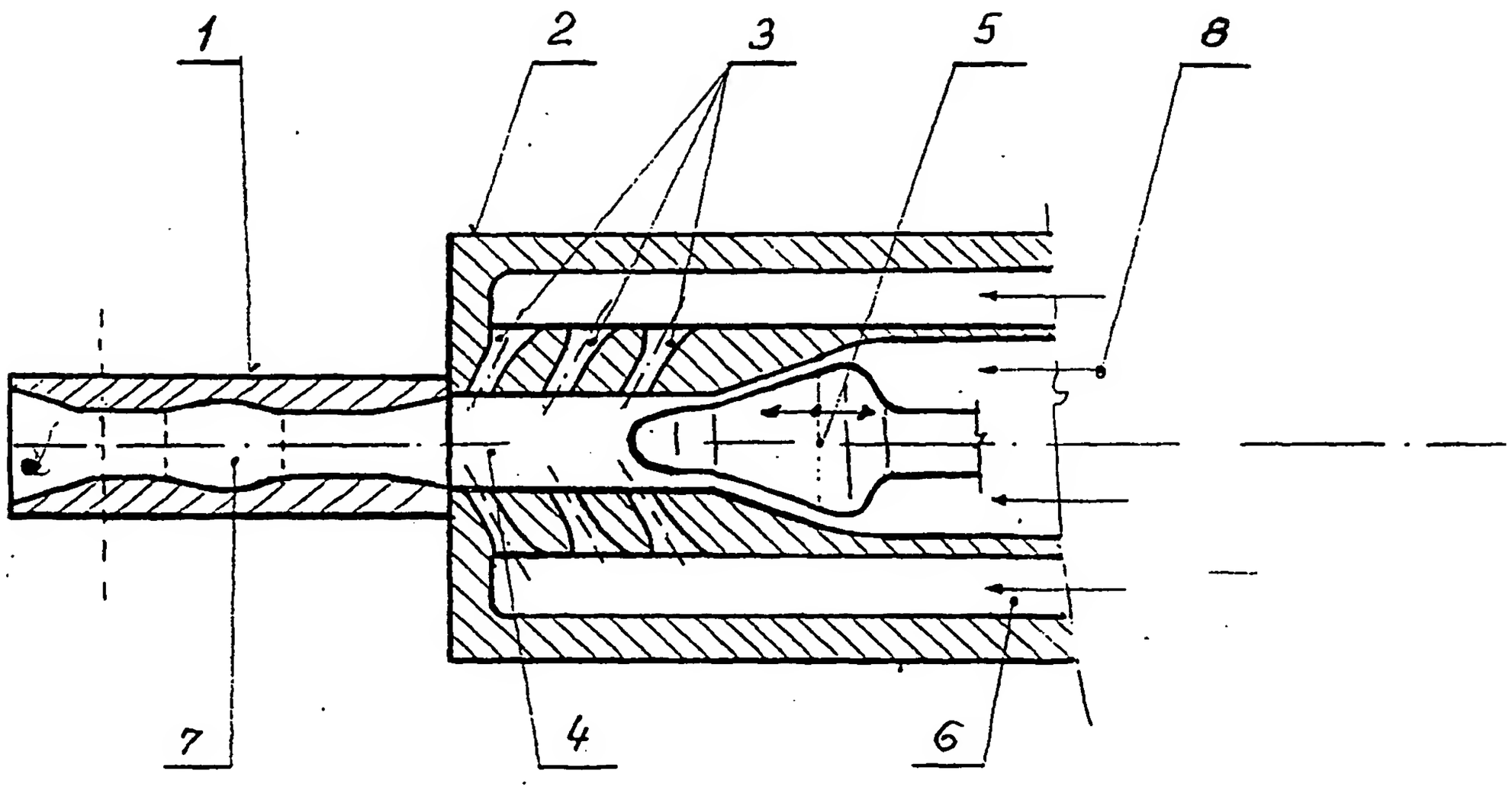
The invention can be used wherever it is necessary to deliver aerosol for a longer distance. It is exceptionally suitable in extinguishing equipment, agricultural sprays and also in army technique.

PATENT CLAIMS

1. Equipment for increasing the radius of carry continual aerosol stream consists from nozzle for accelerating and forming the outgoing aerosol stream and mixing chamber, i s d o m i n a t e d w i t h t h e f a c t, that entry of nozzle for accelerating and forming the outgoing aerosol stream (1) is the output of mixing chamber (4) and axis of the nozzle for accelerating and forming the outgoing aerosol stream (1) is equal with the axis of the mixing chamber (4).
2. Equipment according to the claim 1, i s d o m i n a t e d w i t h t h e f a c t, that the system of nozzles (3) leading into the mixing chamber (4) is radially made to the surface of the cylindrical chamber for the aerosol inlet (6).
3. Equipment according to the claim 1 and 2, i s d o m i n a t e d w i t h t h e f a c t, the mixing chamber (4) is connected on the input side with the inlet gas channel (8) and at the same time the longitudinal shape of the inlet gas channel (8) is conic at the entry into the mixing chamber and in this space there exists and axially adjustable conic solid (5).
4. Equipment according to the claim 1,2 and 3, i s d o m i n a t e d w i t h t h e f a c t, the the homogenizing chamber (7) is placed in the outgoing nozzle (1).



Picture 1



Picture 2

INTERNATIONAL SEARCH REPORT

I tional Application No
PCT/SK 01/00010

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 B05B7/04 A62C31/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A62C B05B B01F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	EP 1 072 320 A (NII NIZKIKH TEMPERATUR PRI MAI) 31 January 2001 (2001-01-31) paragraph '0039! - paragraph '0072!; figures	1,2
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X	US 5 269 461 A (DAVIS, JAMES F.) 14 December 1993 (1993-12-14) column 6, line 51 -column 7, line 44; figures 7,8	1,2

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[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in annex.

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'&' document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
31 July 2001	20/08/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Innecken, A

Form PCT/ISA/210 (second sheet) (July 1992)

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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